REMARKS

Claims 1-3, 5-11, and 13-20 remain for consideration. Claims 1, 7, 11, 13-14, 16, and 19-20 are amended. Support for the amendments may be found throughout the instant specification at, for example, paragraphs [0058]-[0061], [0068], [0077] and FIG. 9. All remaining claims are thought to be allowable over the cited art.

35 U.S.C. § 101

Claims 11 and 16-18 are rejected under 35 U.S.C. § 101 as not falling within one of the four statutory categories of invention. The Applicant respectfully traverses the rejection, but nevertheless amends Claims 11 and 16 to be in better conformance with 35 U.S.C. § 101.

In particular, Applicant has amended Claims 11 and 16 to recite a particular apparatus, such as a processing device and a filter device, that accomplishes the claimed method steps. Applicant respectfully requests, therefore, that the rejection of Claims 11 and 16 be withdrawn. Since Claims 17-18 depend from Claim 16, Applicant respectfully submits that the rejection of Claims 17-18 should be withdrawn as well.

35 U.S.C. § 103

Claims 1, 2, and 7-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0252755 to Jaffey et al (hereinafter "Jaffe") in view of U.S. Patent No. 5,430,768 to Minuhin et al (hereinafter "Minuhin") and further in view of U.S. Patent Publication No. 2003/0174780 to Heikkila et al (hereinafter "Heikkila"). Applicant respectfully traverses the rejection, but nevertheless amends Claim 1 in order to advance prosecution.

For example, Claim 1 is amended to at least set forth a Bit-Edge Zero Forcing Equalizer (BE-ZFE) that includes "a filter tap coefficient module that calculates a plurality of filter tap coefficients, the filter tap coefficient module being adapted to truncate the calculated plurality of filter tap coefficients to include only the most significant filter tap coefficients of the plurality of filter tap coefficients." In other words, of the coefficient values contained within the vector of BE-ZFE filter tap coefficients, e.g., $H_{BE\text{-}ZFE}$ of paragraph [0059] of the instant application, only those coefficient

values of any real significance are kept, e.g., $H_{BE\text{-}ZFE\ (truncated)}$, while the others are truncated, or zeroed, as discussed, for example, in paragraph [0060] of the instant application. Applicant's Claim 1 further recites that "the filter tap coefficient module employs an inverse of a communication channel transfer function," e.g., H_{BE}^{-1}, "and a pulse mapping," e.g., h_{BE}, "to calculate the plurality of filter tap coefficients" as is further discussed in, for example, paragraph [0058] of the instant application.

While the Examiner suggests that Jaffe teaches coefficient ramping circuit 604 that corresponds to the filter tap coefficient module of Applicant's Claim 1 (see page 4 of the Office Action), Jaffe is silent as to the truncation of any of the coefficients provided by coefficient ramping circuit 604. Instead, Jaffe teaches that ALL of the coefficient values are used; more specifically, Jaffe states: "Either the unramped (full or final value) coefficients or the ramped (gradually changing) coefficients are communicated from the decision feedback filter of the receiver to the Tomlinson-Harashima precoder …." (See paragraph [0072]). As a result, Jaffe does not truncate, but rather must transmit all coefficients to the Tomlinson-Harashima precoder in contradistinction to Applicant's Claim 1.

The Examiner further suggests that Heikkila teaches a filter tap coefficient module that employs an inverse of a communication channel transfer function. (See page 6 of the Office Action). Heikkila, however, does not teach the use of the inverse of a channel transfer function, $H(k)^{-1}$, but rather teaches the use of the square of the absolute value of a channel transfer function, $|H(k)|^2$. (See paragraphs [0050]-[0057]). As a result, Heikkila's teachings are in direct contradistinction to Applicant's Claim 1.

Applicant's Claim 1 further recites that "the filter is enabled to modify an original shape of a pulse in a communication channel, wherein the modified pulse is located within a sequence of bit periods" and "wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located to enhance detection of the pulse's original data value from the modified pulse." In other words, an original pulse shape is modified by the filter to generate a modified pulse shape, where the modified pulse shape is different from the original pulse shape and enhances detection of the original pulse's data value.

While the Examiner suggests that the signal issuing from Minuhin's filter 64 is a modified pulse that is similar to the modified pulse of Applicant's Claim 1, Minuhin does not teach that filter 64 modifies the pulse from an original shape to a modified shape. In particular, Minuhin teaches that partial response precoder 42 encodes the data to be written onto data track 26, while filter 64 seeks to shape the pulse read from data track 26 into the same shape the was written onto data track 26. (See column 8, lines 14-36; and column 15, lines 33-55). As a result, Minuhin seeks to return the shape of a pulse into its original shape, while Applicant's Claim 1 seeks to modify the shape of a pulse into a different shape. Thus, Minuhin is in direct contradistinction to Applicant's Claim 1.

For all of the reasons stated above, Applicant respectfully submits that Claim 1 patentably distinguishes over Jaffe, Minuhin, and Heikkila either singularly, or in combination, and is, therefore, in condition for allowance. In addition, Claims 11 and 16 patentably distinguish over Jaffe, Minuhin, and Heikkila either singularly, or in combination, and are in condition for allowance for at least the same reasons as discussed above in relation to Claim 1.

Dependent Claims 2 and 7-9, which are dependent from independent Claim 1, are also rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Jaffe, Minuhin, and Heikkila. While Applicant does not acquiesce to any particular rejections of these dependent claims, it is believed that these rejections are now moot in view of the amendments and remarks made in connection with independent Claim 1. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited references. Therefore, dependent Claims 2 and 7-9 are also allowable over the combination of Jaffe, Minuhin, and Heikkila.

Each rejection of Applicant's Claims 3, 5-6, 8, 10-11, 13-20 as sustained by the Office Action, is supported by various combinations of the teachings of Jaffe, Minuhin, and Heikkila either singularly, or in combination with other references. Namely: on page 9 of the Office Action, Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe, Minuhin, and Heikkila in view of U.S. Patent No. 3,876,941 to Kohlenberg et al (hereinafter "Kohlenberg"); on page 10 of the Office

Action, Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe, Minuhin, and Heikkila in view of U.S. Patent No. 5,249,150 to Gruber; on page 11 of the Office Action, Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe, Minuhin, Heikkila and further in view of U.S. Patent No. 4,852,169 to Veeneman et al (hereinafter "Veeneman"); on page 11 of the Office Action, Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe, Minuhin, Heikkila and further in view of Digital Communication by Edward A. Lee et al (hereinafter "NPL"); on page 12 of the Office Action, Claims 11 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe and Minuhin in view of NPL; on page 15 of the Office Action, Claims 16-17 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe and Minuhin; on page 17 of the Office Action, Claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe and Minuhin in view of NPL; on page 18 of the Office Action, Claim 20 is rejected under U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe and Minuhin in view of Gruber; on page 19 of the Office Action, Claim 14 is rejected under U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe, Minuhin, and NPL in view of Gruber; and on page 20 of the Office Action, Claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Jaffe, Minuhin, NPL and further in view of Veeneman.

The teachings of each reference stated above, however, have not been shown to remedy the deficiencies of the combination of Jaffe, Minuhin, and/or Heikkila as noted above with respect to Applicant's Claims 1, 11, and 16. As such, Claims 1, 11, and 16 patentably distinguish over the combination of Jaffe, Minuhin, and/or Heikkila either singularly, or in combination with, any of the other references stated above. Since Claims 3, 5-6, 8, 10-11, 13-20 depend from Claims 1, 11, and 16, respectively, then Claims 3, 5-6, 8, 10-11, 13-20 also patentably distinguish over the combination of Jaffe, Minuhin, and/or Heikkila with any of the other references stated above and are in condition for allowance for at least the same reasons stated above with respect to independent Claims 1, 11, and 16.

CONCLUSION

Reconsideration and a notice of allowance are respectfully requested in view of the amendments and remarks presented above. If the Examiner has any questions or concerns, a telephone call to the undersigned is invited.

Respectfully submitted,

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I hereby certify that this correspondence is being filed via EFS-Web with the United States Patent and Trademark Office on June 22, 2009.

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